AMENDMENT TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

Claims 1-2 (canceled):

Claim 3 (previously presented): A packet flow control method comprising the steps of:

detecting congestion in a first node along a packet flow path between a source device and a destination device;

identifying a node in said path preceding said first node, wherein said step of identifying a node in said path includes the step of transmitting a signal to said destination device requesting path information; and

transmitting to said preceding node a traffic regulation signal used to initiate flow rate control on flows identified from information included in said traffic regulation signal, wherein said information included in said traffic regulation signal includes a destination address.

Claim 4 (currently amended): A packet flow control method comprising the steps of:

detecting congestion in a first node along a packet flow path between a source device and a destination device, including the ~~steps~~ step of monitoring to detect when said first node is saturated with packet traffic for a preselected period of time;

identifying a node in said path preceding said first node, and

transmitting to said preceding node a traffic regulation signal used to initiate flow rate control on flows identified from information included in said traffic regulation signal, wherein said information included in said traffic regulation signal includes a destination address.

Claim 5 (original): The method of claim 4, wherein said traffic regulation signal further includes packet flow path information.

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Claim 6 (previously presented): The method of claim 5, further comprising the steps of:

operating said preceding node to transmit an additional traffic regulation signal to an additional preceding node to cause the additional preceding node to initiate flow rate control on flows directed to a destination address identified in said additional traffic regulation signal.

Claim 7 (canceled):

Claim 8 (canceled):

Claim 9 (currently amended): ~~The method of claim 8,~~ A packet flow control method comprising the steps of:

detecting congestion in a first node along a packet flow path between a source device and a destination device;

operating the first node to perform a forced reduction in the flow rate of at least one packet flow in response to detecting traffic congestion ~~wherein the forced reduction in the flow rate performed in the first node is performed~~ as a function of a base line flow rate for traffic flowing through the first node; and

identifying a node in said path preceding said first node,

transmitting to said preceding node a traffic regulation signal used to initiate flow rate control on flows identified from information included in said traffic regulation signal, and

operating said preceding node to perform a forced reduction in the flow rate of at least one packet flow in response to detecting traffic congestion ~~wherein the forced reduction in the flow rate performed in the preceding node is performed~~ as a function of a base line flow rate for traffic flowing through the preceding network node.

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Claim 10 (currently amended): A method of implementing flow control in a communications network including a first node, a second node and a destination ~~node~~ device, the first node being located upstream of the second node on a communications path to said destination device, the method comprising the steps of:

operating the second node to detect when the second node is saturated with traffic for a period of time;

in response to detecting that said second node is saturated with traffic for said period of time, operating the second node to send a first traffic regulation signal to the first node to trigger said first node to perform traffic regulation of flow rates on flows of packets directed to said destination device.

Claim 11 (original): The method of claim 10 wherein, in response to detecting that said second node is saturated with traffic for said period of time, said second node performs the step of:

initiating a path determination operation to determine at least a portion of a path of a flow causing congestion at said second node.

Claim 12 (original): The method of claim 11, further comprising:

operating said second node to receive path information identifying said first node as part of said path of the flow causing congestion.

Claim 13 (currently amended): The method of claim 12, further comprising:

operating the second node to detect when the second node ceases to be saturated with traffic after being saturated for said period of time;

in response to the second node detecting that the second node has ceased to be saturated with traffic, sending a second traffic regulation message to said first node to cause said first node to cease traffic regulation of flow rates on flows of packets directed to said destination device.

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Claim 14 (original): The method of claim 12, further comprising:

operating the first node, in response to said first traffic regulation message, to perform forced flow rate reduction operations on at least some flows directed to said destination node.

Claim 15 (original): The method of claim 14, further comprising:

operating the first node to transmit a third traffic regulation message to a node located upstream of said first node in said path of the flow causing the congestion to trigger flow control operations in said node located upstream of said first node.

Claim 16 (original): The method of claim 14, wherein operating the first node to perform forced flow rate reduction operations includes:

comparing packet flow rates of packet flows directed to said destination to at least one flow rate baseline for said first node; and

dropping packets from packet flows directed to said destination which have flow rates exceeding the flow rate base line to which the particular flow rate is compared.

Claim 17 (currently amended): A method of implementing flow control in a communications network including a first node, a second node and a destination device, the first node being located upstream of the second node on a communications path to said destination device, the method comprising the steps of:

operating the second node to detect when the second node is saturated with traffic for a period of time, and in response to detecting such saturation, said second node performs the step of initiating a path determination operation to determine at least a portion of a path of a flow causing congestion at said second node;

operating said second node to receive path information identifying said first node as part of said path of the flow causing congestion;

in response to detecting that said second node is saturated with traffic for said period of time, operating the second node to send a first traffic regulation signal to the first

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node to trigger said first node to perform traffic regulation of flow rates on flows of packets directed to said destination device;

operating the first node, in response to said first traffic regulation message, to perform forced flow rate reduction operations on at least some flows directed to said destination node wherein operating the first node to perform forced flow rate reduction operations includes comparing packet flow rates of packet flows directed to said destination to at least one flow rate baseline for said first node and dropping packets from packet flows directed to said destination which have flow rates exceeding the flow rate base line to which the particular flow rate is compared;

~~The method of claim 16,~~ further comprising, in said first node,

distinguishing, for traffic flow control purposes, between packet flows corresponding to protocol types which are responsive to congestion control signals and packet flows corresponding to protocol types which are not responsive to congestion control signals.

Claim 18 (previously presented): A communications system for communicating information as flows of packets, the system comprising:

a first network node including:

i. congestion control means for detecting congestion at said first network node;

ii. traffic flow path determination means for determining the path of at least one packet flow causing congestion at said first network node; and

iii. early traffic regulation signaling means for transmitting a traffic regulation signal to initiate traffic regulation at an upstream network node; and

an upstream network node, the upstream network node being coupled to the first network node, the upstream network node including:

i. means for receiving traffic regulation signals from said first network node; and

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ii. flow control means for performing flow rate reduction operations on one or more traffic flows identified from information included in received traffic flow control messages.

Claim 19 (currently amended): ~~The communication system of claim 18, further comprising:~~ A communications system for communicating information as flows of packets, the system comprising:

a first network node including:

i. congestion control means for detecting congestion at said first network node;

ii. traffic flow path determination means for determining the path of at least one packet flow causing congestion at said first network node; and

iii. early traffic regulation signaling means for transmitting a traffic regulation signal to initiate traffic regulation at an upstream network node; and

an upstream network node, the upstream network node being coupled to the first network node, the upstream network node including:

a. means for receiving traffic regulation signals from said first network node; and

b. flow control means for performing flow rate reduction operations on one or more traffic flows identified from information included in received traffic flow control messages; and

a destination node coupled to said first network node for serving as the destination of at least some of the packet flows passing through the first network node, the destination node including:

i) means for reconstructing packet flow paths from received information; and

ii) means for transmitting reconstructed packet flow path information to the first network node in response to a request for path information from said traffic flow path determination means.

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Claim 20 (original): The communication system of claim 19, wherein the traffic regulation signal generated by the early traffic regulation signaling means of the first network node includes a destination address corresponding to said destination node.

Claim 21 (original): The communication system of claim 20,

wherein the first network node includes traffic flow rate baselines generated from traffic flowing through the first network node over a period of time; and

wherein the upstream network node includes traffic flow rate baselines generated from traffic flowing through the upstream network node over a period of time.

Claim 22 (original): The communication system of claim 21,

wherein the first network node further comprises flow control means for performing a flow control operation including the dropping of packets from at least one packet flow as a function of at least one of the first network node traffic flow rate baselines.

Claim 23 (original): The communication system of claim 22, wherein the first network node further comprises:

a plurality of packet queues, one packet queue being used to store packets corresponding to a single or each group of flows to which are to be subject to different flow rate reduction operations are part of the processing by said flow control means.

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